

65  
with

74. (New) A method for detecting encephalopathy, renal diseases and cancers, using the method according to claim 29.

75. (New) A method for detecting encephalopathy, renal diseases and cancers, using the method according to claim 59.

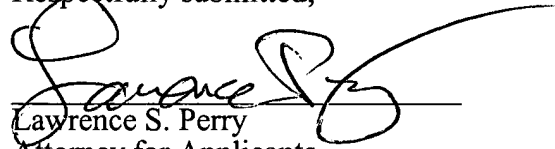
#### REMARKS

The claims have been amended to better conform with accepted U.S. practice and idiomatic format. No new matter has been added.

Entry hereof is earnestly solicited.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

  
Lawrence S. Perry  
Attorney for Applicants  
Registration No. 31,865

FITZPATRICK, CELLA, HARPER & SCINTO  
30 Rockefeller Plaza  
New York, New York 10112-3801  
Facsimile: (212) 218-2200

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

3. (Amended) The polypeptide according to claim 1 [or 2], wherein the activity of transferring fucose to an N-acetylglucosamine residue in the Gal  $\beta$  1-4GlcNAc structure existing in a nonreducing terminus of a sugar chain via an  $\alpha$  1,3-linkage is the Lewis x sugar chain [Gal  $\beta$  1-4(Fuc  $\alpha$  1-3)GlcNAc] and the Lewis y sugar chain [Fuc  $\alpha$  1-2Gal  $\beta$  1-4(Fuc  $\alpha$  1-3)GlcNAc] synthesizing activity, and the activity of transferring fucose to an N-acetylglucosamine residue in the NeuAc  $\alpha$  2-3Gal  $\beta$  1-4GlcNAc structure existing in a nonreducing terminus of a sugar chain via an  $\alpha$  1,3-linkage is the sialyl Lewis x sugar chain [NeuAc  $\alpha$  2-3Gal  $\beta$  1-4(Fuc  $\alpha$  1-3)GlcNAc] synthesizing activity.

4. (Amended) A DNA selected from the following (a), (b), (c), (d), (e), (f), (g) and (h):

(a) a DNA encoding the polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51,

(b) a DNA having nucleotides 280 to 1194 of a nucleotide sequence represented by SEQ ID NO: 3,

(c) a DNA having nucleotides 115 to 1194 of a nucleotide sequence represented by SEQ ID NO: 3,

(d) a DNA having nucleotides 1454 to 2368 of a nucleotide sequence represented by SEQ ID NO: 4,

(e) a DNA having nucleotides 1289 to 2368 of a nucleotide sequence represented by SEQ ID NO: 4,

- (f) a DNA having nucleotides 460 to 1374 of a nucleotide sequence represented by SEQ ID NO: 5,
- (g) a DNA having nucleotides 295 to 1374 of a nucleotide sequence represented by SEQ ID NO: 5, and
- (h) a DNA hybridizing under stringent conditions with DNA selected from (a), (b), (c), (d), (e), (f) and (g); and said DNA encodes a polypeptide having an activity to transfer fucose to an N-acetylglucosamine residue in an N-acetylactosamine (Gal  $\beta$  1-4GlcNAc) structure existing in a nonreducing terminus of a sugar chain via an  $\alpha$  1,3-linkage, but not having an activity to transfer fucose to an  $\alpha$  2,3-sialyl N-acetylactosamine (NeuAc  $\alpha$  2-3Gal  $\beta$  1-4GlcNAc) structure existing in a nonreducing terminus of a sugar chain via an  $\alpha$  1,3-linkage.

6. (Amended) The recombinant DNA according to claim 5 wherein [it] the recombinant DNA is plasmid pAMo-mFT9 or plasmid pBS-hFT9 (S2).

7. (Amended) A transformant having the recombinant DNA according to claim 5 [or 6].

8. (Amended) The transformant according to claim 7 or 52, wherein [it is a] the transformant is selected from the group consisting of microorganisms, animal cells, plant cells, insect cells, non-human transgenic animals, and transgenic plants.

9. (Amended) The transformant according to claim 8, wherein the microorganism belongs to *Escherichia*.

10. (Amended) The transformant according to claim 8<sub>a</sub> wherein the animal cell is selected from the group consisting of mouse myeloma cells, rat myeloma cells, mouse hybridoma cells, CHO cell, BHK cell, African green monkey kidney cells, Namalwa cell, Namalwa KJM-1 cell, human fetal kidney cells, and human leukemia cells.

11. (Amended) The transformant according to claim 8<sub>a</sub> wherein the insect cell is selected from the group consisting of *Spodoptera frugiperda* ovarian cells, *Trichoplusia ni* ovarian cells, and silkworm ovarian cells.

12. (Amended) A method for producing a polypeptide [selected from the polypeptides] according to any one of claims 1, 2<sub>a</sub> [and] 3 and 51, which comprises the steps of:

culturing in a medium a transformant having a recombinant DNA obtained by inserting a DNA encoding the polypeptide into a vector;  
producing and accumulating said polypeptide in said medium; and  
collecting said polypeptide from said medium.

13. (Amended) A method for producing a polypeptide [selected from the polypeptides] according to any one of claims 1, 2<sub>a</sub> [and] 3 and 51, which comprises the steps of:

feeding a non-human transgenic animal having a recombinant DNA obtained by inserting a DNA encoding the polypeptide into a vector;  
producing and accumulating said polypeptide in said non-human transgenic animal; and

collecting said polypeptide from said non-human transgenic animal.

15. (Amended) A method for producing a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, which comprises the steps of:

growing a transgenic plant having a recombinant DNA obtained by inserting a DNA encoding the polypeptide into a vector;

producing and accumulating said polypeptide in said transgenic plant; and

collecting said polypeptide from said transgenic plant.

16. (Amended) A method for producing a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, which comprises the steps of:

using a DNA encoding the polypeptide, and

synthesizing said polypeptide by an *in vitro* transcription-translation system.

17. (Amended) A method for producing a reaction product wherein fucose is added to an N-acetylglucosamine residue in the N-acetyllactosamine structure of an acceptor substrate via an  $\alpha$  1,3-linkage, using a polypeptide selected from [the polypeptides] a polypeptide according to any one of claims 1, 2, [and] 3 and 51 as an enzyme source[;], which comprises the steps of:

placing [the following (a), (b) and (c)] in an aqueous medium[:] (a) said enzyme source, (b) an acceptor substrate selected from (i) N-acetyllactosamine(Gal  $\beta$  1-4GlcNAc), (ii) oligosaccharides having the N-acetyllactosamine structure in a nonreducing

terminus thereof, (iii) complex carbohydrates having the N-acetylglucosamine structure in a nonreducing terminus of sugar chains, (iv) their derivatives wherein the N-acetylglucosamine structure is modified by sulfate group, and (v) their derivatives wherein the N-acetylglucosamine structure is modified by sugar, but a galactose residue in the N-acetylglucosamine structure is not modified by sialic acid via an  $\alpha$  2,3-linkage, and (c) guanosine-5'-diphosphate fucose;

producing and accumulating the reaction product, in the aqueous medium;

and

collecting said reaction product from said aqueous medium.

18. (Amended) The method for producing the reaction product according to claim 17, wherein a derivative is selected from sugar chains having, in a nonreducing terminus thereof, any one of the following oligosaccharide structures: Fuc  $\alpha$  1-2Gal  $\beta$  1-4GlcNAc, Gal  $\alpha$  1-3Gal  $\beta$  1-4GlcNAc, Gal  $\alpha$  1-3(Fuc  $\alpha$  1-2)Gal  $\beta$  1-4GlcNAc, GalNAc  $\alpha$  1-3(Fuc  $\alpha$  1-2)Gal  $\beta$  1-4GlcNAc, Gal  $\alpha$  1-4Gal  $\beta$  1-4GlcNAc, Gal  $\beta$  1-4GlcNAc(6SO<sub>3</sub><sup>-</sup>); and complex carbohydrates containing said sugar chains.

19. (Amended) A method for producing a reaction product wherein fucose is added to a glucose residue in a lactose structure of an acceptor substrate via an  $\alpha$  1,3-linkage, using a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51 as an enzyme source[;], which comprises the steps of:

placing [the following (a), (b) and (c)] in an aqueous medium[:] (a) said enzyme source, (b) an acceptor substrate selected from (i) lactose (Gal  $\beta$  1-4Glc), (ii) oligosaccharides having a lactose structure in a nonreducing terminus thereof,

(iii) complex carbohydrates having a lactose structure in a nonreducing terminus of sugar chains, (iv) their derivatives wherein a lactose structure is modified by sulfate group, and (v) their derivatives wherein a lactose structure is modified by sugar(s), but a galactose residue in the lactose structure is not modified by sialic acid via an  $\alpha$  2,3-linkage, and (c) guanosine-5' -diphosphate fucose;

producing and accumulating the reaction product, in said aqueous medium;

and

collecting said reaction product from said aqueous medium.

20. (Amended) The method for producing the reaction product according to claim 19, wherein a derivative is selected from sugar chains having, in a nonreducing terminus thereof, any one of the following oligosaccharide structures: Gal  $\alpha$  1-3Gal  $\beta$  1-4Glc, Gal  $\alpha$  1-3(Fuc  $\alpha$  1-2)Gal  $\beta$  1-4Glc, GalNAc  $\alpha$  1-3(Fuc  $\alpha$  1-2)Gal  $\beta$  1-4Glc, Gal  $\alpha$  1-4Gal  $\beta$  1-4Glc, Gal  $\beta$  1-4Glc(6SO<sub>3</sub><sup>-</sup>); and complex carbohydrates containing said sugar chains.

21. (Amended) A method for producing a sugar chain having a structure wherein fucose is added to an N-acetylglucosamine residue or a glucose residue via an  $\alpha$  1,3-linkage, or a complex carbohydrate containing said sugar chain[;], which comprises[,]  
the steps of:

culturing in a medium a transformant selected from the transformants derived from microorganisms, animal cells, plant cells, and insect cells according to claim 8;

producing and accumulating the sugar chain or the complex carbohydrate in said medium; and

collecting said sugar chain or said complex carbohydrate from said medium.

22. (Amended) A method for producing a sugar chain having structure wherein fucose is added to an N-acetylglucosamine residue or a glucose residue via an  $\alpha$  1,3-linkage, or a complex carbohydrate containing said sugar chain[;], which comprises[,]  
the steps of:

feeding a nonhuman transgenic animal according to claim 8;

producing and accumulating the sugar chain or the complex carbohydrate in the non-human transgenic animal; and

collecting said sugar chain or said complex carbohydrate from said non-human transgenic animal.

23. (Amended) A method for producing a sugar chain having a structure wherein fucose is added to an N-acetylglucosamine residue or a glucose residue via an  $\alpha$  1,3-linkage, or a complex carbohydrate containing said sugar chain[;], which comprises[,]  
the steps of:

growing a transgenic plant according to claim 8;

producing and accumulating the sugar chain or the complex carbohydrate in said transgenic plant; and

collecting said sugar chain or said complex carbohydrate from said transgenic plant.



24. (Amended) The production method according to [any one of claims] claim 17, [to 23] wherein the complex carbohydrate is selected from the group consisting of glycoproteins, glycolipids, proteoglycans, glycopeptides, lipopolysaccharides, peptideglycans and glycosides wherein a sugar chain binds to compounds such as steroids.

25. (Amended) The method for producing the sugar chain or the complex carbohydrate according to claim 22, wherein the generation and accumulation of said sugar chain or said complex carbohydrate is carried out in the milk of said non-human transgenic animal.

26. (Amended) A method for determining the expression level of a gene encoding a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, by hybridization using DNA encoding the polypeptide.

27. (Amended) An oligonucleotide selected from the following oligonucleotides: an oligonucleotide having an [identical] identical sequence to 10 to 50 contiguous nucleotides in a nucleotide sequence of DNA selected from a DNA encoding the polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51; a DNA having the nucleotide sequence represented by SEQ ID NO: 3; a DNA having the nucleotide sequence represented by SEQ ID NO: 4; and a DNA having the nucleotide sequence represented by SEQ ID NO: 5; and, an oligonucleotide having a complementary sequence to said oligonucleotide and a derivative of each of said oligonucleotides.

29. (Amended) A method for determining the expression level of a gene encoding a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51 by polymerase chain reaction, using [the] an oligonucleotide [according to claim 27 or 28] selected from the following oligonucleotides: an oligonucleotide having an identical sequence to 10 to 50 contiguous nucleotides in a nucleotide sequence of DNA selected from a DNA encoding the polypeptide according to any one of claims 1, 2, 3 and 51; a DNA having the nucleotide sequence represented by SEQ ID NO: 3; a DNA having the nucleotide sequence represented by SEQ ID NO: 4; and a DNA having the nucleotide sequence represented by SEQ ID NO: 5; and, an oligonucleotide having a complementary sequence to said oligonucleotide and a derivative of each of said oligonucleotides.

30. (Amended) A method for detecting encephalopathy, renal diseases and cancers, using the method according to claim 26 [or 29].

31. (Amended) A method for [supressing] suppressing the transcription of a DNA encoding a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, using a DNA selected from a DNA encoding the polypeptide, a DNA having the nucleotide sequence represented by SEQ ID NO: 3, a DNA having the nucleotide sequence represented by SEQ ID NO: 4, and a DNA having the nucleotide sequence represented by SEQ ID NO: 5.

32. (Amended) A method for [supressing] suppressing the translation of an mRNA encoding a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, using a DNA selected from a DNA encoding the polypeptide, a

DNA having the nucleotide sequence represented by SEQ ID NO: 3, a DNA having the nucleotide sequence represented by SEQ ID NO: 4, and a DNA having the nucleotide sequence represented by SEQ ID NO: 5.

33. (Amended) A method for [supressing] suppressing the transcription of a DNA encoding the polypeptide according to any one of claims 1, 2, [or] 3 and 51, using [the] an oligonucleotide [according to claim 27 or 28] selected from the following oligonucleotides: an oligonucleotide having an identical sequence to 10 to 50 contiguous nucleotides in a nucleotide sequence of DNA selected from a DNA encoding the polypeptide according to any one of claims 1, 2, 3 and 51; a DNA having the nucleotide sequence represented by SEQ ID NO: 3; a DNA having the nucleotide sequence represented by SEQ ID NO: 4; and a DNA having the nucleotide sequence represented by SEQ ID NO: 5; and, an oligonucleotide having a complementary sequence to said oligonucleotide and a derivative of each of said oligonucleotides.

34. (Amended) A method for [supressing] suppressing the translation of an mRNA encoding the polypeptide according to any one of claims 1, 2, [or] 3 and 51, using [the] an oligonucleotide [according to claim 27 or 28] selected from the following oligonucleotides: an oligonucleotide having an identical sequence to 10 to 50 contiguous nucleotides in a nucleotide sequence of DNA selected from a DNA encoding the polypeptide according to any one of claims 1, 2, 3 and 51; a DNA having the nucleotide sequence represented by SEQ ID NO: 3; a DNA having the nucleotide sequence represented by SEQ ID NO: 4; and a DNA having the nucleotide sequence represented by

SEQ ID NO: 5; and, an oligonucleotide having a complementary sequence to said oligonucleotide and a derivative of each of said oligonucleotides.

35. (Amended) An antibody recognizing a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51.

36. (Amended) An immunoassay which detects a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, using [the] said antibody [according to claim 35].

37. (Amended) An immunohistological staining method which detects a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, using [the] said antibody [according to claim 35].

38. (Amended) A reagent for immunohistological staining which contains the antibody of [clam] claim 35.

39. (Amended) An agent for diagnosing encephalopathy, renal diseases and cancers, which contains the antibody of [clam] claim 35.

40. (Amended) A method for screening a substance that changes the activity of a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, which comprises contacting said polypeptide with test samples.

41. (Amended) A method for screening a substance that changes the expression of a gene encoding a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, which comprises the steps of:

contacting a cell expressing said polypeptide with test samples, and  
measuring the amount of the Lewis x or Lewis y sugar chain using an anti-Lewis x or anti-Lewis y antibody.

42. (Amended) A method for screening a substance that changes the expression of a gene encoding a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51, which comprises the steps of:

contacting a cell expressing said polypeptide with test samples, and  
measuring the amount of said polypeptide using [the] an antibody [of claim 35] recognizing said polypeptide.

43. (Amended) A promoter DNA for the transcription of a gene encoding a polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51.

44. (Amended) The promoter DNA according to claim 43 which functions in a cell selected from the group consisting of neurons, kidney cells, gastric epithelium cells, leukocyte cells, cerebral tumor cells, neuroblastoma cells, melanoma cells, renal cancer cells, stomach cancer cells, colon cancer cells, and pancreatic cancer cells.

45. (Amended) The promoter DNA according to claim 43 [or 44] which is derived from human or mouse.

46. (Amended) A method for screening a substance that changes the efficiency of transcription by a promoter DNA [selected from the promoter DNAs] according to claim[s] 43, [44 and 45,] which comprises the steps of:

transforming an animal cell with a plasmid comprising the promoter DNA and a reporter gene ligated downstream of said promoter DNA;

contacting transformant with a test sample; and

measuring the amount of the translation product of said reporter gene.

47. (Amended) The screening method according to claim 46, wherein the reporter gene is a gene selected from the group consisting of chloramphenicol acetyltransferase genes,  $\beta$ -galactosidase genes, luciferase genes and green fluorescent protein genes.

48. (Amended) A non-human knockout animal wherein a DNA encoding the polypeptide [selected from the polypeptides] according to any one of claims 1, 2, [and] 3 and 51 is deleted or mutated.

49. (Amended) The non-human knockout animal according to claim 48, wherein the non-human knockout [animal] animal is a mouse.

50. (Amended) A method for treating renal diseases or cancers using a method [of any one of claims] according to claim 31 [to 34].

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